Design Support and Prototyping

[Preece, Chaps 23-28; Hix, Chaps 2,9,11; Neilsen, Chaps 8-9]

Standards

Task: Select

Description: The user specifies a selection from a set of alternatives on an interactive display. The implication is that there is something (an entity) that is selectable, and that there is more than one possible selection. The alternatives might consist of a set of commands, such as items in a menu, or a collection of entities, such as graphic objects.

Task Phrase: <specify> <entity> (from <set of alternatives>)

Properties:

<specify>: none

<entity>: type as identified in conceptual model (for example, command vs. graphic object selection may be two different tasks)

<set of alternatives>: ordered vs. not ordered; range(if variable set); size (if fixed set); may be implied by context if there is a 'currently selected object'

Recommended Techniques:

Keyboard: entity label type-in

Mouse: cursor match

Guidelines

[From Hix & Hartson]

User-Centered Design
- Practice user-centered design
- Know the user
- Involve the user via participatory design
- Prevent user errors
- Optimize user operations
- Keep the locus of control with the user
- Help the user get started with the system

System Model
- Give the user a mental model of the system, based on user tasks

Consistency and Simplicity
- Be consistent
- Keep it simple

Human Memory Issues
- Account for human memory limitations by giving the user frequent closure on tasks
- Let the user recognnize, rather than having to recall, whenever feasible

Cognitive Issues

Use cognitive directness
Draw on real-worl analogies
Feedback
Use informative feedback
Give the user appropriate status indicators
System Messages
Use user-centered wording in messages
Use positive, nonthreatening wording in error messages
Use specific, constructive terms in error messages
Anthropomorphism
Do not anthropomorphize
Modality and Reversible Actions
Use modes cautiously
Make user actions easily reversible
Getting the User's Attention
Get the user's attention judiciously
Display Issues
Maintain display inertia
Organize the screen to manage complexity
Individual User Differences
Accomodate individual user experiences and differences
Accomodate user experience levels

Low-fidelity prototyping

(See Figure 34.)

Rapid Prototyping

Prototypes don't have a lifetime. They are typically throw-away systems used only to study:

- the functionality of the system
- operation sequences
- user support needs
- required representations
- look and feel

Tools for Rapid Prototyping:
Macromedia Director (cross-platform)
GUI Builders:
Hypercard, Supercard (MacOS)
RapidApp (Irix)
UIM/X (X-Windows)
Nextstep (NEXTSTEP)
C++/Views (MS Windows, cross-platform)
Symantec Cafe Studio (Java, cross-platform)

Don't prototype unless:

- objectives and plans are well understood and acknowledged by both designers and users
- possible frequent changes in user requirements

User Interface Management Systems

Given a set of functional modules provided by an application specialist, a user interface designer builds a

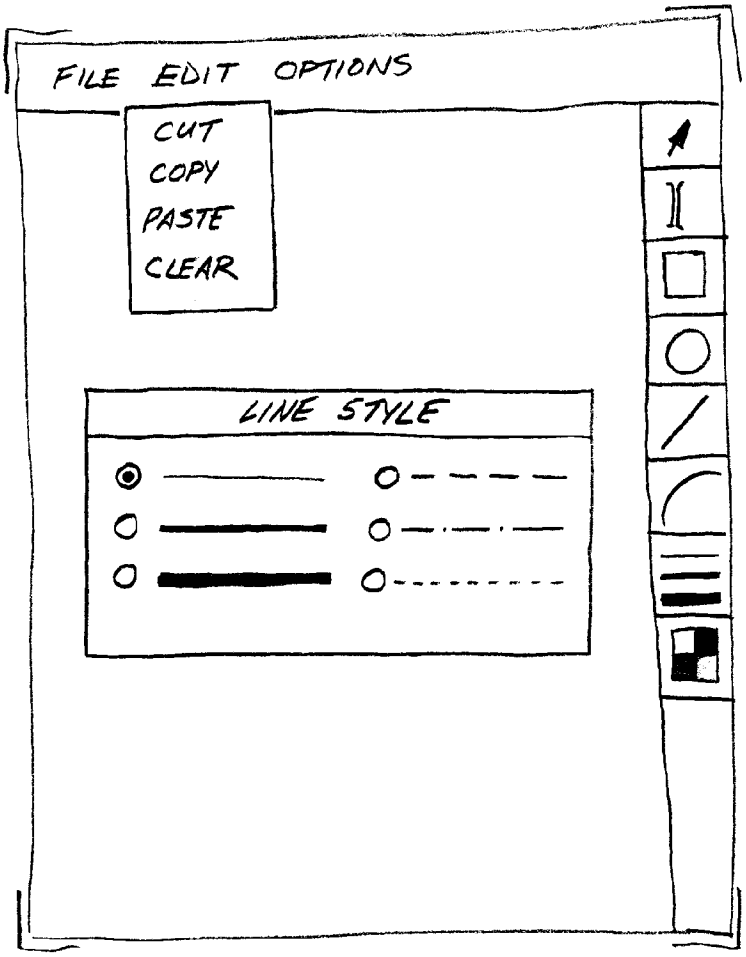

Figure 34.

specialized interface for it. More than a toolkit, a UIMS provides support for:

- Syntax or sequences of commands or parameters
- Window management
- Help and documentation
- Screen format control

(See Figure 35.)

GUI Toolkits/Frameworks

What's the difference between a UIMS, a Toolkit, and a Framework?
(See insert).

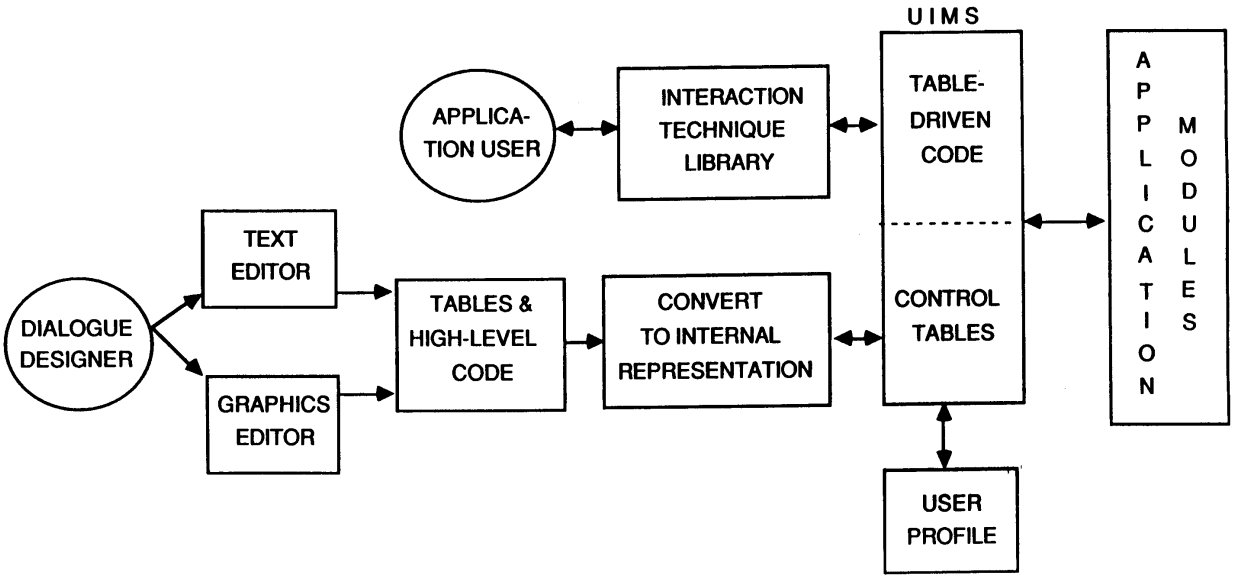
UIMS
APPLICA-
TION USER
INTERACTION
TECHNIQUE
LIBRARY
TABLE-
DRIVEN
CODE
APPLICATION MODULES
TEXT
EDITOR
DIALOGUE
DESIGNER
TABLES &
HIGH-LEVEL
CODE
CONVERT
TO INTERNAL
REPRESENTATION
CONTROL
TABLES
GRAPHICS
EDITOR
USER
PROFILE

Figure 35.